WHAT IS CLAIMED IS:

1. A thermally conductive substrate wherein

a lead frame is provided on one surface of an insulator sheet and a radiation plate is provide on the other surface of the insulator sheet;

a part of said lead frame extends to an end portion of said insulator sheet; and

an end portion of the radiation plate located on and near the end portion of the insulator sheet to which said lead frame extends, is provided at a position away from the end portion of said insulator sheet inside of said insulator sheet in a plane direction of said insulator sheet.

2. A thermally conductive substrate according to claim 1, wherein

the end portion of said radiation plate is provided at a position away from the end portion of said insulator sheet over an entire periphery of said radiation plate, inside of said insulator sheet in the plane direction of said insulator sheet.

3. A thermally conductive substrate according to claim 1, wherein

a clearance between the end portion of the radiation plate located on and near the end portion of the insulator sheet, to which said lead frame extends, and the end portion of said insulator sheet is set to fall within a range of one to four times as large as a thickness of said insulator sheet.

4. A thermally conductive substrate according to claim 1, wherein

said radiation plate is arranged to be embedded in said insulator sheet while a surface of said radiation plate is exposed from said insulator sheet.

5. A thermally conductive substrate according to claim 4, wherein

at least a part of a side surface of said radiation plate in a thickness direction of said radiation plate is covered with said insulator sheet.

6. A thermally conductive substrate according to claim 1, wherein

continuous steps along a direction crossing a shortest direction between said radiation plate and said lead frame are provided on the end portion of said insulator sheet, the end portion of the radiation plate arranged to be away from the end portion of said insulator sheet.

7. A thermally conductive substrate according to claim 1, wherein

an external radiation structure is plane-bonded to an outer surface of said radiation plate, and at least a part of a region along a side surface of said radiation plate in a thickness direction of said radiation plate is exposed from said insulator sheet over an entire periphery of said radiation plate.

8. A thermally conductive substrate according to claim 1, wherein

said insulator sheet contains an inorganic filler.

9. A power module comprising a thermally conductive substrate, an electronic component, a casing and sealing resin, wherein

said thermally conductive substrate is constituted such that a lead frame is provided on one surface of an insulator sheet and a radiation plate is provide on the other surface of the insulator sheet, that a part of said lead frame extends to an end portion of said insulator sheet, and that an end portion of the radiation plate located on and near the end portion of the insulator sheet to which said lead frame extends, is provided at a position away from the end portion of said insulator sheet inside of said insulator sheet in a plane direction of said insulator sheet;

said electronic component is packaged on one surface of said thermally conductive substrate;

said casing is arranged to cover said thermally conductive substrate on which said electronic component is packaged; and

said sealing resin is filled in an internal space of said casing and seals the internal space.

10. A method of manufacturing a thermally conductive substrate having a lead frame provided on one surface of an insulator sheet and a radiation plate provided on the other surface of the insulator sheet, a part of said lead frame extending to an end portion of said insulator sheet, the method comprising the steps of:

building up said lead frame on the one surface of said insulator sheet, building up the radiation plate on the other surface of said insulator sheet over an entire surface of the insulation sheet, and bonding said lead frame, said radiation plate and said insulator sheet to one another;

up to a position away from the end portion of said insulator sheet inside of said insulator sheet in a plane direction of said insulator sheet, an end portion of the radiation plate located on and near an end portion of the insulator sheet, to which said lead frame extends, is removed.

11. A method of manufacturing a thermally conductive substrate according to claim 10, wherein

the end portion of said radiation plate is removed by cutting the end portion.

12. A method of manufacturing a thermally conductive substrate according to claim 10, wherein

the end portion of said radiation plate is removed by a photolithography step.

13. A method of manufacturing a thermally conductive substrate according to claim 10, wherein

a radiation plate having a split groove along a peripheral edge of a to-be-removed radiation plate region is prepared as said radiation plate; and

after the radiation plate is bonded to said insulator sheet, the to-be-removed radiation plate region is divided from other radiation plate regions and removed along said split groove.

14. A method of manufacturing a thermally conductive substrate having a lead frame provided on one surface of an insulator sheet and a radiation plate provided on the other surface of the insulator sheet, a part of said lead frame extending to an end portion of said insulator sheet, the method comprising the steps of:

preparing, as said radiation plate, a case-added radiation plate, an end portion of the radiation plate corresponding to and near the end portion of the insulator sheet, to which said lead frame extends, being removed in advance, a case surrounding an entire periphery of the radiation plate being arranged outside of the radiation plate, and building up said lead frame on the one surface of said insulator sheet and said case-added radiation plate on the other surface of the radiation plate to bond said lead frame, said insulator sheet and said case-added radiation plate to one another; and

removing said case from said insulator sheet.